REMARKS

Present Status of the Application

The Office Action objected the amendment filed August 27, 2009 under 35 U.S.C. 132(a) because it introduces new matter "**without heat-treating the surface of the material with a reactive gas to form a film as a wave-guide path**" into the disclosure. The Office Action required Applicant to cancel the new matter.

The Office Action rejected Claims 1-7 and 9-17 under 35 U.S.C. 112 since the claim(s) contains subject matter which was not described in the specification.

The Office Action rejected Claims 1-17 and 9-17 under 35 U.S.C. 103(a) as being unpatentable over US20040124184A1 to An et al.

The Office Action rejected Claims 1-17 and 9-17 under 35 U.S.C. 103(a) as being unpatentable over US20040013805A1 to Nagata et al.

Applicants respectfully traverse the rejections addressed to claims 1-7 and claims 9-17 for at least the reasons set forth below.

Discussion of the objection under 35 U.S.C. 132(a) and 112:

1. Regarding Claim Amendments:

Applicant has cancelled the new matter part in Claim 1.

Besides, in order to distinguish the present invention more clearly from the cited references, Applicant has amended Claim 1 as the following:

"1. A method of forming a periodic structure, comprising:

irradiating **a surface of a material with** a ~~uniaxial~~ **linearly polarized single** laser beam**, of which a fluence is above but** near**ly as low as** an ablation threshold**, such as to restrain an ablation as much as possible**; and

executing an overlapped scanning on the irradiated region, so as to cause **the** ablation at a section where interference has taken place between **a p-polarization component of** an incident beam and a surface scattered wave **of the p-polarization component** generated along the material surface, and to thereby cause spontaneous formation of a periodic structure **having a ripple spacing near a wavelength of the incident beam in a direction perpendicular to a polarization direction of the incident beam."**

The above amendments are based on Fig. 5 and the related paragraphs [0104] and [0050], listed as the followings, and cause no matters.

[0104]:"Fig. 5 shows a periodic structure formed with a laser fluence lowered closest possible to the ablation threshold, so as to restrain the ablation as much as possible."

[0050]:" When a linear-polarized laser beam is irradiated on the substrate, an interference takes place between the p-polarization component of the incident beam 1 and the surface scattered wave along the substrate surface. When the fluence of the incident beam is near the ablation threshold, the ablation takes place only at a region of the interference between the incident beam and the surface scattered wave along the substrate surface."

Based on the disclosure in the original specification (paragraph [0104]), **Claim 1 now specifies that the fluence is above but nearly as low as the ablation threshold, such as to**

restrain ablation as much as possible. It is clear from the disclosure, and is now explicit in Claim 1, that the fluence is above the ablation threshold. Claim 1 also has the functional definition concerning the proximity of the fluence to the ablation threshold: it is such as to restrain ablation as much as possible.

Discussion of the rejection under 35 U.S.C. 103 (a):

2. Regarding Claim 1:

Newly cited reference, **US20040124184A1 (An et. Al.)**, relates to a technology as describe in paragraph [0034] and [0035] that surface wave is formed in accordance with a wavelength of a laser beam in the state that a surface of the substrate is melted by laser beam irradiation. The surface temperature thereof is above the melting threshold, **but far lower than an ablation threshold. It is thus a completely different technology from the present invention**.

On the contrary, in the present invention, surface temperature of the substrate reaches above but **nearly as low as the ablation threshold, such as to restrain ablation as much as possible**.

Newly cited reference, **US20040013805A1 (Nagata et. Al.)**, relates to a technology as describe in the paragraph [0014] that **diffraction gratings are formed on the heat-treated deposit by the laser light**. It is thus a **completely different technology from the present invention**.

In accordance with the above analysis, An et al and Nagata et al both failed to disclose at least the following features of Claim 1 of the present invention:

"irradiating **a surface of a material with** a ~~uniaxial~~ **linearly polarized single** laser beam**, of which a fluence is above but** near**ly as low as** an ablation threshold**, such as to restrain an ablation as much as possible**;" .

Hence, independent **Claim 1 of the present invention is non-obvious over An et al and Nagata et al**.

2. Regarding Claim 2-7 and 9-17:

Based on the above analysis, independent Claim 1 is non-obvious over An et al and Nagata et al. Hence, **Claims 2-7 and 9-17, which are directly or indirectly depending on Claim 1, are also non-obvious over An et al and Nagata et al**.

CONCLUSION

For at least the foregoing reasons, it is believed that all the pending claims 1-7 and claims 9-17 of the present application are patentable. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted,
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